# Chapter 13

# How did the animals fit on Noah's Ark?

- What animals did Noah take onto the Ark?
- Where did they store all the food?
- How could the Ark be big enough?
- What about all the animal wastes?

**M**ANY sceptics assert that the Bible must be wrong, because they claim that the Ark could not possibly have carried all the different types of animals. This has persuaded some Christians to deny the Genesis Flood, or believe that it was only a local flood involving comparatively few animals.

Usually such doubters have not thought it through. On the other hand, the classic creationist book *The Genesis Flood* contained a detailed analysis as far back as 1961.[1] A more comprehensive and updated

1. Whitcomb, J.C. and Morris, H.M., 1961. *The Genesis Flood*, Presbyterian and Reformed Publishing Co., Phillipsburg, NJ, USA.

technical study of this and many other related questions is John Woodmorappe's book *Noah's Ark: a Feasibility Study*.[2]  This chapter is based on material in these books plus some independent calculations. There are two questions to ask:
- How many types of animals did Noah need to take?
- Was the Ark's volume large enough to carry all the necessary types?

## How many types of animals did Noah need to take?

Relevant passages are:

*And you shall bring into the ark two of every kind of every living thing of all flesh, to keep them alive with you. They shall be male and female.  Two of every kind shall come to you to keep them alive; of birds after their kind, and of beasts after their kind, of every creeping thing of the earth after its kind.* (Gen. 6:19–20)

*You shall take with you every clean animal by sevens, the male and female. And take two of the animals that are not clean, the male and female.  Also take of the birds of the air by sevens, the male and the female, to keep seed alive upon the face of all the earth.* (Gen. 7:2–3)

In the original Hebrew, the word variously translated as 'beast' or 'cattle' in these passages is the same: *behemah*, and it refers to land vertebrate animals in general.  The word for 'creeping things' is *remes*, which has a



Image by Steve Cardno

---

2.   Woodmorappe, J., 1997. *Noah's Ark: A Feasibility Study.* Institute for Creation Research, El Cajon, CA, USA. Woodmorappe has devoted seven years to this scholarly, systematic answer to virtually all the anti-Ark arguments, alleged difficulties with the biblical account, and other relevant questions. Nothing else like this has been written before—a powerful vindication of the Genesis Ark account.

*God brought to Noah all kinds of air-breathing land animals to be saved from the Flood.*

number of different meanings in Scripture, but here it probably refers to reptiles.[3] Noah did not need to take sea creatures[4] because they would not necessarily be threatened with extinction by a flood. However, turbulent water carrying sediment would cause massive carnage, as seen in the fossil record, and many oceanic species probably did become extinct because of the Flood. If God in His wisdom decided not to preserve some ocean creatures, this was none of Noah's business.

Noah did not need to take plants either—many could have survived as seeds, and others could have survived on floating mats of tangled vegetation, as seen today after severe storms. Many insects and other invertebrates were small enough to have survived on these mats as well. According to Genesis 7:22, the Flood wiped out all land animals that breathed *through nostrils* except those on the Ark. Insects do not breathe through nostrils but through tiny pores ('tracheae') in their exterior skeleton ('shell').

**Clean animals:** Bible commentators are evenly divided about whether the Hebrew means 'seven' or 'seven pairs' of each type of clean animal. Woodmorappe takes the latter meaning just to concede as much to the sceptics as possible. But the vast majority of animals are not clean, and were represented by only two specimens each. The term 'clean animal' is not defined in Scripture until the Mosaic Law. But since Moses was also the writer / compiler of Genesis, if we follow the principle that 'Scripture interprets Scripture', the Mosaic Law definitions can be applied

---

3. Jones, A.J., 1973. How many animals on the Ark? *Creation Research Society Quarterly* **10**(2):16–18.
4. It is high time that certain atheistic sceptics showed some intellectual integrity and actually read the Bible. Then they would stop making ridiculous comments about whales flopping up gangplanks, and fish-tanks on the Ark.

to Noah's situation. Actually, Leviticus 11 and Deuteronomy 14 list very few 'clean' land animals.

## What is a 'kind'?

God created a number of different types of animals with much capacity for variation within limits.[5] The descendants of each of these different kinds, apart from humans, would today mostly be represented by a larger grouping than what is called a *species*. In many cases, those species descended from a particular original kind would be grouped today within what modern taxonomists (biologists who classify living things) call a *genus* (plural *genera*).



*Zebras, donkeys and horses— probably one biblical kind.*

One common definition of a species is a group of organisms which can interbreed, producing fertile offspring, and do not mate with other species. However, most of the so-called species within a particular genus or family have not been tested to see what they can or cannot mate with. Obviously the extinct ones cannot be tested. In fact, not only are there known crosses between so-called species, but there are many instances of mating between genera, so the 'kind' may in some cases be as high as the family. Identifying the 'kind' with the genus is also consistent with Scripture, which spoke of kinds in a way that the Israelites could easily recognize without the need for tests of reproductive isolation.

For example, horses, zebras and donkeys are probably descended from an equine (horse-like) kind, since they can interbreed, although the offspring are largely sterile. Dogs, wolves, coyotes and jackals are probably from a common canine (dog-like) kind. All different types of domestic cattle (which are clean animals) are descended from the aurochs,[6] so there were probably at most seven (or possibly 14) domestic

---

5. One common fallacy brought up by evolutionists is that variation within a kind somehow proves particles-to-people evolution. Examples cited, such as antibiotic resistance in bacteria, are indeed examples of *natural selection*. But this is *not* evolution. Evolution requires the creation of *new* genetic information, which is not possible by natural processes, such as mutations and natural selection. See Chapter 1, pp. 9–10, 13–15.

6. Wieland, C., 1992. Re-creating the extinct aurochs? *Creation* **14**(2):25–28.

cattle aboard. The aurochs itself may have been descended from a cattle kind that also gave rise to bison and water buffaloes. We know that tigers and lions can produce hybrids called tigons and ligers, so it is likely that they are descended from the same original kind.

Woodmorappe tallied up about 8,000 genera, including extinct genera. Thus about 16,000 individual animals had to be aboard. With extinct genera, there is a tendency among some paleontologists to give each of their new finds a new genus name. But this is arbitrary, so the number of extinct genera is probably highly overstated.

Consider the sauropods, which were the largest dinosaurs—the huge plant-eaters like *Brachiosaurus*, *Diplodocus*, *Apatosaurus*, etc. There are 87 sauropod genera commonly cited, but only 12 are 'firmly established' and another 12 are considered 'fairly well established'.[7]

## Dinosaurs?

One commonly raised problem is 'How could Noah fit all those huge dinosaurs on the Ark?' First, of the 668 supposed dinosaur genera, only 106 weighed more than ten tonnes when fully grown. Second, the Bible does not say that the animals had to be fully-grown. The largest animals were probably represented by 'teenage' or even younger specimens. It may seem surprising, but the median size of all animals on the Ark would most likely have been that of a small rat, according to Woodmorappe's up-to-date tabulations, while only about 11 percent would have been much larger than a sheep. See also Chapter 19, pp. 230 ff.



*The eggs of even the largest dinosaurs were no bigger than a football, so all young dinosaurs were quite small.*

## Germs?

Another problem often raised by atheists and theistic evolutionists is 'How did disease germs survive the Flood?' This is a leading question— it presumes that germs were as specialized and infectious as they are

---

7.  McIntosh, J.S., 1992. Sauropoda. In: Wieshampel, D.B. *et al*., *The Dinosauria*, University of California Press, Berkeley, CA, p. 345.

now, so all the Ark's inhabitants must have suffered from every disease on Earth today. But germs were probably more robust in the past, and may have only fairly recently lost the ability to survive in different hosts or independently of a host. In fact, even now many germs can survive in insect vectors or corpses, or in the dried or frozen state, or be carried by a host without causing disease. Furthermore, degeneration of hosts could allow microbes to cause disease where in the past the microbes may have lived in the host's gut, for example, without causing disease. Such loss of resistance would be consistent with the general degeneration of life since the Fall.[8]

## Was the Ark large enough to carry all the necessary types?

The Ark measured 300x50x30 cubits (Gen. 6:15), which is about 137x23x13.7 metres or 450x75x45 feet, so its volume was 43,200 $m^3$ (cubic metres) or 1.52 million cubic feet. To put this in perspective, this is the equivalent volume of 522 standard railroad stock cars, each of which can hold 240 sheep.

If the animals were kept in cages with an average size (some would be much bigger, others smaller) of 50x50x30 centimetres (20x20x12 inches), that is 75,000 $cm^3$ (cubic centimetres) or 4,800 cubic inches, the 16,000 animals would only occupy 1,200 $m^3$ (42,000 cubic feet) or 14.4 stock cars. Even if a million insect species had to be on board as well, it would not be a problem, because they require little space. If each pair was kept in cages of 10 cm (four inches) per side, or 1,000 $cm^3$, all the insect species would occupy a total volume of only 1,000 $m^3$, or another 12 cars. This would leave room for five trains of 99 cars each for food, Noah's family and 'range' for the animals, and air space. However, insects are not included in the meaning of *behemah* or *remes,* so Noah probably did not have to take them on board as passengers anyway.

Tabulating the total volume is fair enough, since this shows that there would be plenty of room on the Ark for the animals with ample left over for food, space to move, etc. It would be possible to stack cages, with food

---

8. Wieland, C., 1994. Diseases on the Ark. *Journal of Creation* **8**(1):16–18. Viruses often become much more infectious by random mutations causing changes in their protein coats. This makes it harder for the antibodies to recognize them, but there is no increase in information content, so no real evolution.

on top or nearby (to minimize the amount of food carrying the humans had to do), to fill up more of the Ark space, while still allowing plenty of gaps for air circulation. We are discussing an emergency situation, not necessarily luxury accommodation. Although there is plenty of room for exercise, sceptics have overstated animals' needs for exercise anyway.
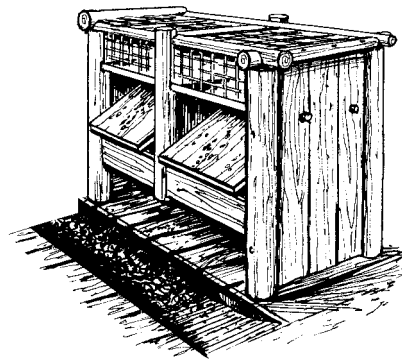
Even if we don't allow stacking one cage on top of another to save floor space, there still would be no problem. Woodmorappe shows from standard recommended floor space requirements for animals that all the animals together would have needed less than half the available floor space of the Ark's three decks. This arrangement allows for the maximum amount of food and water storage on top of the cages close to the animals.

## Food requirements

The Ark would probably have carried compressed and dried foodstuffs, and a lot of concentrated food. Perhaps Noah fed the cattle mainly on grain, plus some hay for fibre. Woodmorappe calculated that the volume of foodstuffs would have been only about 15% of the Ark's total volume. Drinking water would have taken up less than 10 % of the volume. This volume would be reduced further if rainwater were collected and piped into troughs.

## Excretory requirements

How did Noah's family dispose of the waste of thousands of animals every day? The amount of labour could be minimized in many ways. Possibly they had sloped floors and/or slatted cages, where the manure could fall away from the animals and be flushed away (plenty of water around!) or destroyed by vermi-composting (composting by worms) which would also have provided earthworms as a food source for animals. Very deep bedding can sometimes last for



*Simple sloped floors under cages with slatted floors would make them self-cleaning (from Woodmorappe,[2] used with permission).*

a year without needing a change. Absorbent material (e.g. sawdust, softwood shavings and especially peat moss) would have reduced the moisture content and hence the odour.

### Hibernation

The space, feeding and excretory requirements were adequate even if the animals had normal day/night sleeping cycles. But hibernation is a possibility that would reduce these requirements even more. It is true that the Bible does not mention it, but it does not rule it out either. Some creationists suggest that God created, or enhanced, the hibernation instinct for the animals on the Ark, but we should not be dogmatic either way.

Some sceptics argue that food taken on board rules out hibernation, but this is not so. Hibernating animals do not sleep all winter, despite popular portrayals, so they would still need food occasionally.

## Conclusion

We have shown here that the Bible can be trusted on testable matters like Noah's Ark. Many Christians believe that the Bible can only be trusted on matters of faith and morals, not scientific matters. But we should consider what Jesus Christ Himself told Nicodemus:

*If I have told you earthly things and you do not believe, how shall you believe if I tell you heavenly things?* (John 3:12)

Similarly, if the Bible can be wrong on testable matters such as geography, history and science, why should it be trusted on matters like the nature of God and life after death, which are not open to empirical testing? Hence Christians should *'be ready always to give an answer to everyone who asks you a reason of the hope in you'* (1 Peter 3:15), when sceptics claim that the Bible conflicts with known 'scientific facts'.

Seeing that the Bible can be trusted on testable matters, nonbelievers disregard its warnings concerning future judgment at their own peril.